



UNITED STATES NAVY

MEDICAL NEWS LETTER

Editor - Captain L. B. Marshall, MC, USN (RET)

Vol. 27

Friday, 8 June 1956

No. 11

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Policy

The U.S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be nor are they susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

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Notice

Due to the shortage of medical officers, the Chief, Bureau of Medicine and Surgery, has recommended, and the Chief of Naval Personnel has concurred, that Reserve Medical Officers now on active duty who desire to submit requests for extension of active duty at their present stations for a period of three months or more will be given favorable consideration. BuPers Instruction 1926.1B applies.

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Career Incentives

During the past year or so, a great deal of attention has been given to improving career incentives for the Armed Forces in general. This has been done to try to create a career military service which can compete with the attractive opportunities available in civilian pursuits. During the last session of Congress, a pay bill was passed which raised all military pay. The Contingency Option Act was also passed which gave military personnel the opportunity to participate in a plan to increase the income of survivors of military personnel dying after retirement. At the present time, a Survivor Benefits Bill is under consideration by the Senate. This bill has already passed the House and provides more adequate and equitable benefits for survivors of active duty service personnel. Another bill that affects career attractiveness for the Armed Forces as a whole and is now under consideration by a Joint Committee in Congress is the Dependent Medical Care Bill. This bill would create uniform procedures for dependent medical care among all the Services, it would crystallize into law the present traditional medical care benefits and would improve the availability of dependent medical care to every serviceman.

The above actions have related to all segments of personnel in the Armed Forces. Certain groups have had problems peculiar to those groups, and certain legislation affecting only those groups has either been enacted or is pending. The bill relating to improving career incentives for Nurse Corps officers, which has just been introduced in Congress, is such a bill. This bill proposes to authorize 0.2% of the strength of the Nurse Corps to be in the rank of Captain in the Navy, 5% in the rank of Commander, and unlimited promotion up to and including Lieutenant Commander based upon the running mate system. This bill also permits Nurse Corps officers to be members of Nurse Corps selection boards. A somewhat similar bill affecting the Medical Service Corps is expected to be proposed soon. This proposed bill would remove the limitation of 2% of the strength of the Corps in the rank of Captain in the Navy, and would also permit Medical Service Corps officers to be members of Medical Service Corps selection boards.

Of great importance to the Medical and Dental Corps of the Armed Services is Public Law 497 of the 84th Congress. This bill was known as the Medical and Dental Officer Career Incentives Bill. One of its purposes was to equalize promotion for medical and dental officers by giving them credit for the time spent in medical or dental school and medical internship by bringing them up to a lineal position equal to their college graduate contemporaries in the line and other staff corps. Another purpose of the bill was to bring the pay of military medical and dental officers up to the range of pay of civilian physicians and dentists in other branches of the Federal service and to also lessen the disparity between military pay and that of the average income of civilian physicians and dentists. This bill provides four years of constructive service for the time spent in medical or dental school and one year of constructive service for the year of medical internship for both promotion and pay purposes. It also authorizes total special pay for medical and dental officers as follows: \$100 per month during the first two years of service as a medical or dental officer (exclusive of internship); \$150 per month after two years and with less than six years of service as a medical or dental officer; \$200 per month after six years and with less than 10 years of service as a medical or dental officer; \$250 per month after 10 years of service as a medical or dental officer. This bill was signed by the President on 30 April 1956 and became law on 1 May 1956. AlNav 16-56 gives instructions concerning the procedures necessary to carry out the provisions of this law.

Certain administrative actions not related to the legislative actions referred to above have also recently been taken to improve career attractiveness for medical and dental officers. Chief among these are the following:

1. Expansion of the Residency Training Program.
2. Reduction of tours of sea duty for medical officers to 12 months except for those medical officers who are practicing their specialty at sea, as in the case of flight surgeons and submarine medical officers. This policy will become effective this summer when adequate replacements will be available from among the medical officers expected to report for active duty after 1 July 1956.

3. The policy of accepting requests for voluntary retirement from all medical and dental officers with 20 or more years of active service.

4. The policy of accepting resignations from regular medical and dental officers who have no obligated service for training and who have served two years or more on active duty.

It has been and will continue to be the policy of the Surgeon General to constantly inquire into and recommend such action as is necessary to make careers in the Medical Department as attractive as possible. Just how successful this policy has been is evidenced by the fact that during the current fiscal year there have been more applicants for the Regular Navy in both the Medical and Dental Corps than during the past five years combined. These have far exceeded the attrition rate from all causes during this current fiscal year. (Bureau of Medicine and Surgery)

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Change of Address

Please forward requests for change of address for the News Letter to: Commanding Officer, U.S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

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Fate of Children with Bronchiectasis

Although much has been written in recent years on the subject of bronchiectasis, few studies have dealt specifically with the disease in childhood. Many authors observe how frequently the manifestations of this condition appear in early life, but in the main the prognosis and treatment of the disease in adults are considered.

This article records the results of a follow-up study carried out during 1950 on a group of children with bronchiectasis. These children were admitted to the Newcastle Regional Thoracic Surgery Centre between 1935 and 1948. All were under the age of 15 at the time of admission to the hospital when the diagnosis of bronchiectasis was established. As it was felt that at least 2 years were necessary to evaluate progress, only those cases in whom treatment was completed before December 1948 were included. There were 209 cases in the series and it was possible to follow-up 208 of them. The period of follow-up in these cases extends from 2 to 15 years with an average follow-up in the survivors of 6.4 years. Although a much longer period of observation will be required before a proper estimate of progress can be made, many

of the patients have been followed into adult life and at least some idea of their fate has been obtained.

The 209 cases were composed of 119 girls and 90 boys; most observers seem to agree that the disease is slightly more common in the female sex.

A study of this material gives some indication of the place of medical treatment in childhood bronchiectasis. It can be seen that cases of fairly localized cylindric bronchiectasis with mild symptoms do extremely well if treated conservatively. There was no mortality in these cases and, although most of them still have cough and sputum, they are able to lead a normal life without any restriction of activity. Cases in whom the disease is too extensive to warrant surgery must therefore be treated medically. Alexander and Strieder have estimated that about 50% of all bronchiectasis falls into this group, but with modern techniques the proportion is certainly less. Inevitably, the prognosis in a group of such cases will be bad and many will die of acute pulmonary infections or other complications. The occasional case, however, will show striking improvement and symptoms may diminish as the child grows up. In assessing the prognosis of such a case, the nature of the symptoms is often of greater importance than the anatomic extent of the bronchiectasis. Fetid sputum, copious expectoration, frequent feverish bouts and finger clubbing are unfavorable prognostic signs. Of the 17 medically treated cases with a fatal outcome, 9 had fetid sputum, 10 had very frequent feverish bouts, and 12 had clubbing of the fingers. The bronchiectasis was bilateral in 11 cases and in only 2 was it confined to one lobe.

The bad results attending conservative treatment in the past have received a good deal of attention in the literature. Roles and Todd, Findlay and Graham, Perry and King, Riggins, Lisa and Rosenblatt, and Ford stress the high mortality in bronchiectasis treated medically; in the present group of 61 cases on medical treatment, there were 17 deaths (mortality 28%), all of them within 5 years of being in the hospital. Thirteen of the 17 cases, however, were rejected as being too severe for surgical treatment and it is obvious that the mortality is mainly in this group. The majority of these deaths were known to have been caused by acute respiratory infections. Cookson and Mason have shown how these patients may undergo sudden and quite unexpected changes for the worse. Nevertheless, with modern antibiotics, it is now possible to treat the infective complications which are the great danger of the disease and there is no doubt that with proper management much can be done for cases that, 10 or 15 years ago, would have had a very gloomy prognosis.

Medical treatment plays a most important part in the preparation of patients for operation and, although this point has not been emphasized, all surgically treated cases in the present series underwent an intensive course of postural coughing, breathing training, and physical exercises before they were submitted to operation. One has only to observe the difference in the general health of a child after 3 or 4 weeks of this treatment, to

realize how effective it may be. At its best, however, medical treatment is essentially a palliative measure and, although much of the distress of the complaint may be alleviated, the dangers of a fulminating lung infection, cerebral abscess, and other complications remain.

If possible, surgical extirpation of the diseased area is the treatment of choice. The steady reduction in the operative mortality over the last 15 years has made pneumonectomy and lobectomy reasonably safe procedures, and most workers are agreed that the risks of operation are least in childhood. In the majority so treated, the results have been good and there seems every reason to expect continued good health in these cases. In many, a dramatic improvement has resulted from the cessation of cough, sputum, and febrile exacerbations following the operation, and even if all have not achieved complete freedom from symptoms, most of the patients have been benefited.

Some authorities regard bronchiectasis as a disease which may spread insidiously throughout the lung. There was no evidence from a study of these cases to support this concept of bronchiectasis as a spreading process. The x-ray films taken at the follow-up examination did not show any clear evidence of spread either in cases treated conservatively or in those following operation. This is in accord with the view of Churchill and Belsey, Perry and King, Diamond and VanLoon, and Lisa and Rosenblatt, who found that the extent of the disease was maximal at the time the diagnosis was made. Although fresh areas of bronchiectasis may appear if a suitably predisposing illness develops, this must be extremely rare, and in general, the pattern of the disease remains unchanged over long periods of time. Symptoms may increase in severity from time to time, but as this does not indicate spread of the disease, there is no urgency for surgical treatment on this account. The timing of the operation is an important matter and each child should be considered individually in this respect.

It is shown that sinusitis is a frequent concomitant of the disease in childhood. In the majority of cases, this appears to be secondary to the bronchiectasis, but it undoubtedly plays a part in keeping the pulmonary infection alight; many febrile exacerbations of the disease start with an upper respiratory infection. Hence, in the preparation of these children for operation, great attention is now paid to the treatment of sinus infection. Antral puncture and lavage, replacement with antibiotics, or regular displacements are usually helpful in minimizing nasal sepsis at the time of operation and in the postoperative period, and it is rarely advisable to resort to radical nasal surgery in children. Following the lung resection, further treatment is given if necessary and every attempt is made to clear up any residual paranasal infection before the child is discharged from the hospital. Persistent sinusitis is probably an important cause of chest symptoms after operation.

In the majority of these children, symptoms began in the early years of life. In nearly all cases, the disease began with an acute respiratory infection. The most common initial illness was pneumonia, but infectious diseases—particularly pertussis and measles—were also important.

One hundred and sixty-three cases were treated surgically. Pneumonectomy was performed in 48 cases, lobectomy or segmental resection in 112 cases. The late results are described in these cases, many of whom have been followed into adult life. The effect of certain symptoms, notably asthma, on the prognosis of operated cases is discussed.

Medical treatment was adopted in 46 cases and an additional 15 cases were considered, making a total of 61 cases treated conservatively. These cases are considered in three groups: (1) where the condition was too mild for surgery; (2) where the bronchiectasis was too severe for surgery; and (3) where surgical treatment was refused. The late results are described in each group. (Strang, C., The Fate of Children with Bronchiectasis: Ann. Int. Med., 44: 630-655, April 1956)

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Acetylsulfisoxazole

Acetyl-Gantrisin is the N'-acetyl derivative of Gantrisin (sulfisoxazole). The effectiveness of sulfisoxazole and its relative freedom from toxicity have made it a sulfonamide of choice. However, in suspension, its bitter taste and after-taste have been difficult to mask. Recently, an acetyl derivative has become available. The suspension forms of this compound have an excellent and very acceptable taste and it is, therefore, much easier to give to children.

The purpose of this study was to evaluate the clinical effectiveness and toxicity of this new form of sulfisoxazole in suspension and to determine the influence of dosage and the time intervals between doses upon its concentration in the blood and urine of children.

The data on blood levels indicate that acetylsulfisoxazole is absorbed and excreted more slowly than sulfisoxazole. Peak levels are usually reached at 6 hours after a single dose compared to 4 hours with sulfisoxazole. The levels with the same dosage are relatively lower and more prolonged with acetylsulfisoxazole than those reported with similar doses of sulfisoxazole.

Optimum minimum levels for clinical effectiveness are not known exactly. As with antibiotics, the relation between blood level and clinical effectiveness may be poor in many situations. Rhoads and co-workers found an average level of 9.4 mg. % sulfisoxazole to be effective in the treatment of meningo-coccal meningitis. He employed doses up to 3 to 4 gm. intravenously as the initial dosage in the children in his series. In such cases, it is probably wise to attain such levels initially by intravenous administration and, subsequently, to use the larger oral dose (i.e., 0.3 gm per kilogram daily for maintenance).

The therapeutic results indicate that the new suspension of acetylsulfisoxazole is a useful drug in the treatment of common infections in infants and children, particularly where the older suspension of sulfisoxazole may be refused because of its taste. In this study, all but 11 of the 76 patients

treated had a good to excellent response. Bigler and Thomas treated 71 children with otitis, tonsillitis, and pharyngitis, cervical adenitis, bronchitis, broncho-pneumonia, lobar pneumonia, and urinary infections with sulfisoxazole with an excellent response in all but 7. Price and Hansen, in a similar series of 82 children, but including 15 with diarrhea, noted an excellent response to sulfisoxazole in all but 9.

It appears, therefore, in this series that the clinical results with acetyl-sulfisoxazole were comparable to those reported by others with sulfisoxazole.

The particular advantage of acetylsulfisoxazole in suspension form is its almost universal acceptance by infants and children because of its excellent taste in the preparations. (Hagler, S., et al., Clinical and Laboratory Evaluation of Acetylsulfisoxazole (Acetyl-Gantrisin) in Children: J. Pediat., 48: 588-595, May 1956)

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Myocardial Infarction in White and Negro Races

None of the investigations into the etiology of coronary artery disease and its occurrence in females has considered the Negro race separately. In a previous communication, the authors reported the results of a study of 330 cases of proved myocardial infarctions; 162 were white and 168 were Negroid. While the Caucasian males outnumbered the females 3:1, there was no sex difference among the Negroes.

The clinical records of 519 cases of proved myocardial infarction were reviewed. In each instance, the diagnosis was established by the clinical findings and substantiated by characteristic electrocardiographic changes or necropsy findings.

The history of each case was thoroughly reviewed as to the presence of angina pectoris prior to infarction. Chest pain, that appeared two weeks or less before infarction, was considered to be premonitory and was not included in the analysis. Angina occurred with considerably greater frequency among members of the white race. More than twice as many white females (57%) as Negro females (26%) experienced this distressing symptom and one and one-half times as many white as Negro males.

There were 233 white patients of whom 173 were males and 60 were females. This represents a sex ratio of 2.9:1 and is in general accord with the figure accepted in the literature. Of 286 Negro cases, however, 158 were males and 128 were females. This ratio of males to females is only 1.2:1 and differs with high statistical significance from the sex ratio in whites. It is important to note that, in the many studies dealing with the sex incidence of coronary artery disease, the Negro race has never been specifically considered. In the present series, the incidence of myocardial infarction in the Negro was approximately 52% of that in the Caucasian.

A review of the age of all patients at the time of initial infarction revealed a further striking deviation from the classical picture described in coronary artery disease. The rarity of myocardial infarction in females, and especially in those of the younger age groups, has been regarded to be quite valuable in the differential diagnosis of chest pain. In a recent review of the literature, Thomas and Cohen found it generally accepted that myocardial infarction may occur in a few young men under the age of 40, but is extremely rare among young women of this age. They cited current reports confirming the following widely held views: (1) that there is a sharp increase in the incidence of coronary atherosclerosis between the ages of 30 and 40 in men and between the ages of 50 and 69 in women, and (2) that the incidence of marked coronary atherosclerosis in necropsy studies reaches a maximum between 50 and 59 years of age in men, whereas in women, a plateau is reached after the seventh decade. Clinically, the initial appearance of myocardial infarction is said to occur most often between the ages of 56 and 60; in a recent study, however, 39% of cases sustained the initial attack after the sixtieth year. In the present study, only four white females (6.6%) suffered an infarction prior to the fiftieth year of life, yet this occurred in 43 (33.6%) of the Negro women. Before the age of 60, 81 Negro females (63%) had suffered a myocardial infarction as contrasted to only 13 (22%) of white females. While the observations in this series concerning white females, white males, and Negro males are in complete accord with those generally accepted, this is not true of the Negro females. Infarction actually occurred earlier in the Negro female than in any other category, even earlier than in the white male.

The present investigation confirmed the observation that females having coronary artery disease tend to be more obese than do men afflicted with this condition. No significant racial difference was noted. Similarly, hypertension was found to occur more frequently in the females of both races than in the males. This has been well established and no racial deviation was observed. An analysis of the frequency of a familial history of cardiovascular disease merely confirmed well-documented views. It was not possible to evaluate adequately the role of tobacco or alcohol in this study because of the large number of records not mentioning these agents. It became obvious, however, that all of the patients included in this series were from a similar economic level. No important differences in dietary habits were noted. Laboratory reports dealing with anemia were comparable in both races.

The incidence of diabetes mellitus was similar in the males and in the females of both races. This metabolic disease occurred in 3.5% of white males, 5.1% of Negro males, 15% of white females, and 15.6% of Negro females.

Because of the startling absence of the usual sex incidence of myocardial infarction in Negroes, it was considered that ovarian dysfunction might be involved. However, no significant difference in productivity was observed between white and Negro females. It should be noted that 42% of

the white cases and 41% of the Negroes could not be properly evaluated because of inadequate records. Of possible significance was the observation that pelvic surgery during the childbearing period was performed on 20.3% of the Negro females as contrasted with only 5% of the white cases, a ratio of 4:1. The importance of this finding remains to be determined.

The mortality rate in the present study was greatest among the Negro females. This, again, is a startling deviation from the classical description of myocardial infarction in women. It would almost appear that coronary atherosclerosis is a different disease in the Negro female as compared with that described in the literature. The explanation of this variation presents a definite challenge. Further extensive study of the Negro female is essential and may well afford an insight into the pathogenesis of coronary artery disease. (Keil, P. G., McVay, L. V. Jr., A Comparative Study of Myocardial Infarction in the White and Negro Races: *Circulation*, XIII, 712-717, May 1956)

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Pulmonary Brucellosis

Brucellosis is one of the most important of the new diseases discovered in recent times by bacteriological methods, and should be considered early in the diagnosis of an obscure illness. Unfortunately, there is no one reliable specific test generally available for the diagnosis. In the diagnosis of brucellosis, the finding of *Brucella* by blood culture is diagnostic, but the test requires careful and rigid technique not available to the great group of practitioners most likely to observe the early cases. Then, too, the obtaining of a positive culture is largely a matter of accident in acute brucellosis and is rarely found in chronic brucellosis. One should emphasize that negativity of any one test does not necessarily indicate that a Brucellar infection is not present either in acute or chronic pulmonary brucellosis.

The too great tendency of physicians to tell their patients they have recovered after several weeks treatment of the acute type, or a short term of therapy in the chronic phase, is wrong. One cannot be certain that such patients have recovered or might relapse into the chronic type of brucellosis. Their apparent immunity may or may not be due to a low-grade subclinical infection localized in the hilar and mediastinal lymph nodes, small nodularities within the pulmonary parenchyma; or elsewhere in the body. The burden of proof as to whether a Brucellar infection is present should rest upon the attending physician to properly interpret all available data—history, clinical symptomatology, and differential diagnostic procedures, in conjunction with relative evaluation of the intradermal, agglutination, and opsonocytophagic tests, and blood culture if available, combined with mature unbiased clinical knowledge and judgment.

Because blood cultures for *Brucella* are not readily available in a large proportion of the cases of chronic brucellosis, physicians must re-evaluate

the specific importance of additional laboratory tests when blood cultural studies are not obtainable. The present-day tendency to rely on a few blood cultures, or blood cultures in conjunction with the agglutination test in chronic brucellosis, may lead to frequent diagnostic failures. It is true that the agglutination reaction is usually positive in cases with positive blood cultures, but this relationship is not necessarily true; in chronic brucellosis, especially the abortus type, the finding of a positive blood-agglutination reaction in a significant titer is the exception rather than the rule. Its persistent absence or presence in a low titer has been reported repeatedly in both acute and chronic cases with positive blood cultures; however, it is a valuable adjunct whenever a positive blood culture is not obtained. It is obvious that one cannot rely entirely on either the blood culture or the blood agglutination reaction singly, because one or both tests may be negative in both acute and chronic brucellosis. Especially is the latter statement true if the brucellar infection is well localized within the body of the patient. The agglutinins may be fleeting and bear no relationship to the activity of the disease. It is also an erroneous concept that lessening of the blood-agglutination titer indicates a favorable prognosis. The intradermal brucellergin test should be deferred until after the agglutination and opsonocytophagic tests have been concluded; otherwise, agglutinins and opsonins may be stimulated and the value of the test of little importance. Many physicians use the skin test as the sole diagnostic procedure. The significance of the test is comparable, generally speaking, to that of the intradermal tuberculin test, and if positive, indicates usually that the patient has been infected with Brucella at some previous time. A positive intradermal brucellergin reaction does not determine the present status of the brucellar infection. A positive intradermal reaction, whatever the degree—low or high when associated with the presence of specific opsonins, especially of low titers—indicates the presence of an infection with Brucella. The diagnosis of active brucellosis depends upon the skill and judgment of the physicians and repeated laboratory and clinical observations over a period of months. In this way, a diagnosis may be made. One is not dealing with a disease similar to typhoid and typhus fevers, but more like tuberculosis; certainly, a patient with tuberculosis would not be discharged after three weeks' treatment with antibiotic therapy. It is well known that acute brucellosis frequently relapses and may persist as a low-grade infection for months or years or may remain localized for years, subsequently assuming an active status as a really severe disease process. The author's opinion is that in the cases with pulmonary involvement localization may occur in the hilar nodes and the small nodularities in the pulmonary parenchyma as observed in the x-ray films of the chests of cases in this series. (Greer, A. E., Pulmonary Brucellosis: Dis. Chest, XXIX: 508-516, May 1956)

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Irradiation in the Treatment of Wilms' Tumor

Controversy still exists regarding the best method of treatment of malignant renal tumors in children. This article presents the results of treatment of 28 cases and suggests more extensive utilization of preoperative irradiation.

While the true incidence of the disease is not known, it is thought to account for approximately 20% of malignant neoplasms in children and to rank in frequency with ocular neoplasms. Although the tumor is found most frequently in the first 4 years of life, it has been described in the fetus, the newborn, and in each decade up to and including the ninth. A large hard mass in the abdomen may be discovered by the parent or the physician during a routine physical examination. Cases have been reported in which rupture of the tumor was the first indication of the disease.

Rare cases of bilateral involvement have been described. The lesion has appeared simultaneously in identical twins on opposite sides, in three and possibly four children of one family, in a horseshoe kidney, in the isthmus of a horseshoe kidney, and in the remaining kidney of one patient 10 years after the removal of the opposite kidney for Wilms' tumor.

The tumor remains confined by the renal capsule until late, and thus the capsule serves to prevent direct spread to adjacent organs.

There has been considerable opportunity to study the effect of irradiation on these tumors. Following irradiation, there is a rapid decrease in the size of the mass due to destruction of radiosensitive elements of the tumor. Histologically, there is necrosis, increase in fibrous stroma, and, occasionally, large fibroblasts having the appearance of "foreign-body type" giant cells. Perivascular fibrosis is an important feature. Changes in the adjacent kidney consist of degeneration of the tubules, increase in the fibrous stroma, and necrosis and hyalinization of the glomeruli. Some authors believe that calcification in the tumor is a good prognostic sign where hematuria, indicating invasion of the renal pelvis by the tumor, carries with it a grave outlook.

It appears obvious that, although irradiation may hold the disease in abeyance for 2 or more years, nephrectomy is essential for a "cure."

Gross and Neuhauser advocate immediate nephrectomy complemented by postoperative irradiation directed to the renal fossa. This is based on their observation of 47% 2-year "cure" by that method as compared with their result of 32% "cure" for 2 years by operation alone. The authors are awaiting their report of 5-year studies on these cases.

The authors have found metastatic lesions as late as 42 months following treatment with preoperative irradiation, and 61 months following irradiation alone. Furthermore, they deplore the application of radiation unless there is definite evidence of residual neoplasm. They do not feel justified in subjecting a patient to postoperative irradiation unless residual neoplasm is known to be present or is strongly suspected.

Once the diagnosis of Wilms' tumor has been established with reasonable certainty, the authors recommend starting radiation therapy immediately. Their plan consists of treating the tumor with 200 kv. radiation, 50 cm. focal skin distance, 0.9 or 1.9 mm. Cu half-value layer, directed to adequate anterior and posterior portals. For large tumors, a lateral portal is added. Two hundred r in air are delivered to each of two portals daily. The total air dose has ranged between 3600 and 4800 r, to provide a tumor dose of between 2000 and 3000 r. In the case of uncooperative patients, the authors have not hesitated to use a rectally administered general anesthetic. Eight to twelve weeks following the beginning of the irradiation, a nephrectomy is done. Following this, examination is recommended at intervals of not longer than 3 months including a roentgenogram of the chest for detection of metastasis to the lungs. In the event that pulmonary metastasis is discovered, irradiation is begun immediately. A tumor dose of approximately 1000 r is delivered to the involved area. (Kerr, H. D., Flynn, R. E., The Role of Irradiation in the Treatment of Wilms' Tumor in Children: Am. J. Roentgenol., 75: 971-975, May 1956)

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Renal Papillary Necrosis

Renal papillary necrosis, also called necrosis of the renal papillae, necrotizing papillitis, and papillitis necroticans, is an uncommon condition usually found in diabetic patients, although it may occur in non-diabetics.

In spite of the high mortality in these cases, the correct antemortem diagnosis is of more than academic interest because the disease has two important characteristics that require a proper therapeutic regimen: (1) It is a suddenly developing and rapidly progressing necrotizing bacterial lesion that must be treated aggressively and without delay. (2) The selective necrosis involving the tips of the papillae impairs the urinary drainage of the associated nephrons, making definitely hazardous the use of sulfonamide drugs and related compounds with their known tendency to precipitate out in the renal tubules under conditions of urinary stasis or acid-base imbalance.

The gross and microscopic features of this entity have been well documented in the literature and have been shown to be remarkably constant, differing only slightly according to the stage of the disease at the time of pathologic examination. Also, the findings have been shown not to be influenced essentially by different etiologic organisms or by the presence or absence of diabetes.

The radiographic findings in this entity are the result of destruction of the papillae and/or the associated inflammatory process. The roentgen diagnosis is, therefore, dependent on the period or phase of the disease in which the examination is performed. A tabulation of the roentgen findings from

the early to the late stages, as reported in the literature and observed, follows:

1. Delay in or complete lack of function, most commonly unilateral, is probably the earliest roentgen finding.
2. Mild to moderate dilatation of the collecting system may be seen. This may be limited to a single calyx, a group of calyces, or the entire collecting system. This sequence of events may be reversed if there is obstruction of the lower urinary tract.
3. A mottled moth-eaten appearance of the fornices occurs. This results from necrosis and sloughing of the renal papillae. In this respect, the findings are similar to those seen in tuberculosis.
4. Gross filling defects may be seen throughout the calyces and pelvis, representing necrotic slough and blood clots.
5. An interesting phenomenon is the occurrence of "ring shadows." These are radiolucent halos rimming dilated calyces. The halos probably represent defects left by a sequestered papilla and occur in an advanced stage of the disease. The presence of numerous "ring shadows" produces a striking radiographic picture.
6. In advanced cases with peripheral necrosis and cavitation, the contrast material is seen to extravasate into the renal cortex. Occasionally, a large portion of a pyramid may break off and float down to the renal pelvis where it will produce a filling defect simulating a tumor or nonopaque stone.

The diseases to be considered in the radiographic differential diagnosis are renal tuberculosis, renal tumor, renal calculus associated with colic, and acute pyelonephritis without necrosis. (Evans, J. A., Ross, W. D., Renal Papillary Necrosis: Radiology, 66: 502-508, April 1956)

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Leukoplakia of the Renal Pelvis and Ureter

Leukoplakia of the renal pelvis and ureter is an infrequent lesion in the urinary tract. The etiology is as uncertain today as when first described in the bladder by Rokitansky in 1861, or when observed 20 years later in the renal pelvis by Ebstein. Leukoplakia is a disease of unknown etiology involving mucous membranes as well as skin. In the urinary tract, it is characterized by an epidermoid metaplasia of the mucosa in various stages with marked keratinization and desquamation. This condition, while rare, becomes of considerable clinical importance because of the unsatisfactory treatment and the possibility of malignant degeneration.

Leukoplakia occurs about equally among the sexes and is most common in the fourth decade with the third and fifth being next most common. It has been observed as early as 4 months and as late as 72 years. It is usually unilateral, occurring more frequently in the renal pelvis than in the ureter.

Patch, in an analysis of 152 cases of leukoplakia of the urinary tract, found the bladder involved 110 times, the renal pelvis 36, and the ureter only 6 times.

The presenting symptoms are those usually produced by, or associated with, the coexisting disease. Irritation or infection, usually present, may produce the presenting complaint. Flank pain, either dull or colicky, may be present. Hematuria, present in one of the three reported cases, occurred in 35% of the patients in Kutzmann's collection. The presence of flaky substances in the urine or of a heavy sediment may be observed.

The lack of any specific symptom renders the diagnosis difficult to make. Pyelographic changes alone are too inconsistent and variable to be of any definite diagnostic aid. The presence of cornified squamous epithelial cells in the urine should be considered pathognomonic.

Leukoplakia is considered a premalignant lesion, and treatment should be directed with that in mind. Potts estimates that 8.4% of squamous cell carcinoma follows leukoplakia. Kutzmann found 8 malignant lesions in 67 cases; however, only 5 of these were squamous cell carcinoma. The incidence of squamous cell carcinoma associated with leukoplakia is much too frequent to be coincidental, making the treatment of choice either nephrectomy or nephroureterectomy as the case may warrant.

One should first ascertain the presence or absence of involvement of the other kidney by repeated cytologic studies. If the disease is bilateral, the treatment by necessity must be conservative. Treatment is directed toward the elimination of any existing infection and the promotion of drainage. Lavage and irrigations of the renal pelvis and the administration of large doses of vitamin A may be tried. (Politano, V. A., Leukoplakia of the Renal Pelvis and Ureter: J. Urol., 75: 633-641, April 1956)

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Problems Associated with Continuous Use of Sunglasses and Tinted Lenses for Elimination of Glare

As commonly used, the term "glare" has various meanings. Here, it will be used to signify any brightness within the field of vision of such character as to cause an unpleasant sensation, a temporary blurring of vision, or eye fatigue. Infra-red probably adds nothing to the blurring of vision and, under normal conditions, little to eye fatigue. However, ultraviolet radiant energy definitely causes blurred vision as the result of fluorescence of the eye media.

The elimination of glare from extensive areas of snow, water, sand, roadways, and city streets in bright sunlight by the use of tinted lenses is easy and satisfactory; there is no problem in making a selection by trial of a glass that will adequately serve the purpose.

Through the continued use of dark lenses, it has been found that the eye becomes more or less accustomed to a lower illuminance or level of illumination so that glare may result when the eye is exposed to a certain higher level of illumination to about the same extent as if no glasses had ever been worn. On the other hand, if a person spends a major part of the time out of doors in sunlight, the eye becomes accustomed to the higher illuminances so that it may be possible to see comfortably without any glasses. However, most of us require protection during those times when we are outside in bright sunlight because the greater part of our lives is spent indoors under a lower level of natural or artificial illumination. This "habit forming" characteristic of the eye can be controlled to a certain extent by guarding against the use of shaded lenses of any kind (except possibly in certain pathological cases) while indoors or under conditions of similarly low illuminance. In most homes and offices the level of illumination is so low that the normal eye requires all the available light for comfortable seeing. The best lens, with the usual light covering of dust, oil, et cetera, reduces the light flux density about 10%. The use of tinted lenses would reduce the visibility of objects even more. Hence, the practice of prescribing corrected tinted lenses for use in the home or office is probably erroneous in most cases because most inside working conditions now have illumination levels which are too low for best results.

For use in sunlight, there is oftentimes a need for corrected lenses because eye fatigue may be caused by lack of proper refraction corrections as well as glare. This is especially the case on long automobile trips when the eyes are kept constantly fixed on the highway for hours at a time. For persons requiring corrected lenses, two alternatives are possible: the use of commercially available "clip on" protective sunglasses and prescription ground tinted lenses. If the refractive corrections are small for distant vision, corrected lenses made from tinted sunglass stock are preferable because the wearing of two sets of glasses over the eyes has a number of disadvantages. If, on the other hand, the refractive corrections are large, an excessive variation in shade over the area of the lens will result unless the lens is very thick. As most corrective glasses are converging, the resulting glass will be dark in the center and light around the edge—a condition just the opposite of that desired for most efficient reduction of glare.

There are several possible solutions to this problem on non-uniform density. The use of a metalized coating on the finished corrective lens, that is made from clear glass, will produce a tinted sunglass of uniform density, which may be of any shade depending upon the amount of metal deposited upon the glass. The use of polaroid between clear glass plates will give a neutral glass having a luminous transmittance of about 35%. In this case, most of the absorption is within the polarizing layer which is not disturbed in grinding and polishing operations. Clear glass may be "flashed" to give any color or density by coating one side with colored glass. The glass may then be

polished on both sides. If ground and polished slightly concave on the flashed side, a lens may be obtained that is of light shade or clear in the center with increasing density toward the edge. Any refractive corrections would then be ground on the clear surface of the glass. (Spectral-Transmissive Properties and Use of Eye-Protective Glasses: U.S. Department of Commerce, National Bureau of Standards Circular 471) (ProfDiv, BuMed)

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Training and Utilization of Hospital Corpsmen

Maximum utilization of enlisted Hospital Corpsmen is mandatory if individual commands and the Medical Department as a whole are to successfully accomplish their missions. To this end, training in basic Hospital Corps Schools has been reduced to a minimum and falls into three categories as follows:

1. Enlistees with four years' obligated service are given the full course of instruction which was reduced from 20 weeks to 16 weeks on 1 February 1956. This 16 weeks' course provides the same amount of instruction in nursing and other subjects directly related to patient care as did the 20 weeks' course. This instruction is designed to equip Hospital Corpsmen to perform those operational duties common to all corpsmen during their first four years of duty.

2. Hospital Corpsmen with only two years' obligated service are given 12 weeks of basic fundamental training in Hospital Corps Schools. This course provides 150 hours' instruction in nursing as compared to 200 hours in the 16 weeks' course. This instruction is designed to equip corpsmen to perform operational duties common to all corpsmen during their first two years of active duty.

3. Hospital Corpsmen with only two years' obligated service, whose civilian training and experience have qualified them as technicians in the Hospital Corps, are transferred direct from Recruit Training Centers with no Hospital Corps training to fill vacant billets in their specialty. Others in this category for whom no vacancies exist in their specialty are given 12 weeks' Hospital Corps training and are assigned as general duty Hospital Corpsmen until such time as vacancies occur. All are assigned the appropriate Navy Job Code number.

After completion of the above basic training, Hospital Corpsmen are assigned duties in accordance with the needs of the service. As many as possible are transferred to naval hospitals; however, it has been necessary to transfer some technicians with no basic Hospital Corps School training and some with only 12 weeks' of such training direct to other shore stations, to the fleets and to the Fleet Marine Force without the benefit of hospital experience prior to reporting to their first ship or station for duty. Responsible

Medical Department personnel should give due consideration to the amount of basic training each has received and to special qualifications as related to billet requirements in the assignment and utilization of these Hospital Corpsmen.

The above procedures were instituted in order to keep as many Hospital Corpsmen as possible in operational billets. It is equally important to maintain the quality of Hospital Corpsmen in operational billets at the highest possible level. Therefore, all Hospital Corpsmen, and in particular, technicians who have received no training in basic Hospital Corps Schools and those who have received only 12 weeks' such training, should participate in an intensive well-organized inservice training program to qualify them to perform all the duties of their rate and for advancement within their rating.

On-the-job training in work situations is an essential part of such a training program. Active participation and enthusiastic support on the part of every Medical Department officer and petty officer is necessary to insure an effective training program. (PersDiv, BuMed)

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Revision in Schedule of Postgraduate Course Offered
to Navy Medical Officers

(Refer to Medical News Letter, Vol. 27, No. 10, p 20)

Applications are desired from Regular Navy Medical officers and Reserve officers, who have recently reported to active duty, for attendance at a course of instruction in Preventive Medicine to be conducted at the Naval Medical School, National Naval Medical Center, Bethesda, Md., commencing 20 August 1956 and ending 21 December 1956, instead of commencing 10 September 1956, as indicated in the Medical News Letter, Vol. 27, No. 10, p 20.

Enrollment is limited to 12 officers of the Navy plus 12 officers of the U.S. Air Force.

Requests from interested and eligible personnel should be submitted via official channels to the Chief, Bureau of Medicine and Surgery. Officers requesting the course must include in their requests an agreement to remain on active duty for a period of 18 weeks following its completion, or for 18 weeks following the expiration of currently required active duty.

Deadline for receipt of applications is now 15 July 1956.

ALL OFFICERS PLEASE NOTE THE CHANGE IN CONVENING DATE, DEADLINE FOR RECEIPT OF APPLICATION, AND THE SERVICE AGREEMENT, ALL OF WHICH ARE CHANGES FROM THE ORIGINAL COURSE AS PRINTED IN THE NEWS LETTER, VOL 27, NO. 10, P 20.

Reliefs cannot be provided for those approved for attendance. Minimum security clearance classification of Secret is required. (ProfDiv, BuMed)

From the Note Book

1. Rear Admiral B. W. Hogan, MC USN, Surgeon General, U.S. Navy, received an honorary degree of Doctor of Science, at Marquette University, Milwaukee on June 3, 1956. (TIO, BuMed)
2. Rear Admiral B. E. Bradley, MC USN, Deputy and Assistant Chief, will represent the Bureau of Medicine and Surgery, and serve as a Military Delegate at the Annual House of Delegates' meetings of the American Medical Association, June 11 - 15, 1956. (TIO, BuMed)
3. Rear Admiral R. A. Kern, MC USNR (Ret) was voted in office by the Board of Governors of the American College of Physicians, as President Elect, at the Annual Meeting. (TIO, BuMed)
4. Captain F. J. Braceland, MC USNR (Inactive), Advisor and Consultant to the Surgeon General, U.S. Navy, took office as President of the American Psychiatric Association on May 4, 1956. (TIO, BuMed)
5. Captain E. E. Hedblom, MC USN, representing the Bureau of Medicine and Surgery, will present a series of lectures on Operation Deepfreeze I to the Staff at the U. S. Naval Hospitals, Philadelphia, Pa., St. Albans, N. Y., Newport, R. I., and Chelsea, Mass., May 14 - 18, 1956. (TIO, BuMed)
6. The third annual reunion of crew of the USS Enterprise (CVS-5) will be held in New York on September 1-3. Vice Admiral M. B. Gardner, Deputy Chief of Naval Operations, Navy Department, is honorary chairman, and Mr. M. S. Cochran, Findlay, Ohio, is chairman of the arrangements committee. (O. O. I., Navy Dept.)
7. The Tenth Annual Reunion of officers who served at the USNH Brooklyn, N. Y., during World War II, was held on 12 April 1956. This is believed to be the first such medical organization and the first meeting was held in 1946 in honor of the late Captain G. E. Robertson, MC USN, who was the Commanding Officer of the hospital during the War. (Captain J. A. deVeer, MC USNR (Ret))
8. The U. S. Naval Dental Service Officer Training Programs manual is currently being revised in the Dental Division, Bureau of Medicine and Surgery, for the fiscal year 1957. This manual will be distributed to all teaching facilities before the start of the next training year. (TIO, BuMed)
9. A postgraduate seminar on diseases of the heart for more than 300 civilian and Armed Forces medical officers will be conducted by the AFIP in co-sponsorship with the American Heart Association, May 14 - 17. (AFIP)

10. The use of spinal anesthesia in 8114 obstetrical cases suggests that the technique is safe, that under certain circumstances it has distinct advantages over other types of anesthesia and that it is applicable in approximately 70% of cases. (Am. J. Obst. & Gynec., May 1956; S. Burge, M.D., C. E. Baldwin, Jr., M.D.)

11. The May 1956 issue of the American Journal of Medicine presents a symposium on the Pathologic Physiology of Thyroid Diseases. The symposium summarizes modern concepts of normal and morbid physiology of the thyroid gland with special consideration of the rational management of these diseases.

12. An effective regimen for treatment of "low-salt syndrome," utilizing Diamox, ammonium chloride, and mercurial diuretics is presented in Circulation, May 1956; A. L. Rubin, M.D., W.S. Braverman, M.D.

13. Most swallowed foreign objects will pass without difficulty if time is allowed. A few objects such as bobby pins and long straight pins may become stuck at the stomach outlet, at the ligament of Treitz, or lower in the small bowel. A magnet on a string or catheter is a simple and satisfactory method of removing magnetic foreign bodies from the stomach, duodenum, or jejunum. (J. Pediat., May 1956; H.I. Laff, M.D., R.P. Allen, M.D.)

14. Cancer diagnosis by bone marrow smears is discussed in Ann. Int. Med., April 1956; C. H. Jaimet, M.D., H. E. Amy, B.A.)

15. Four cases are reported from a series of 50 in which a new type of prosthesis has been successfully fitted over blind unsightly eyes. (Arch. Ophth., May 1956; R. B. Scott)

16. The clinical courses of 37 diabetic patients with nodular intercapillary glomerulosclerosis and of 37 without this lesion are reviewed in the New England J. Med., May 10, 1956; F.H. Epstein, M.D., V.J. Zupa, M.D.)

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Board Certifications

American Board of Anesthesiology
CDR Thomas C. Deas MC USN

American Board of Neurological Surgery
LCDR Sanford F. Rothenberg MC USNR (Active)

American Board of Orthopedic Surgery

CAPT Desales G. DuVigneaud MC USN
CAPT Robert B. Johnson MC USN

American Board of Pediatrics

LT William S. Kiyasu MC USNR (Active)

American Board of Radiology

LT Theodore G. Balbus MC USNR (Active)

American Board of Surgery

LCDR William C. Davis MC USN
CAPT P. K. Perkins MC USN

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Recent Research ProjectsNaval Medical Research Institute, NNMC, Bethesda, Md.

1. A Rapid Reading and Handling System for Miniature Condenser Type Ionization Chambers. Memo Report 56-5. NM 000 018.07, 8 November 1955.
2. Immunological Studies in Renal Homotransplantation. NM 007 071.21.04, 1 December 1955.
3. The Heats of Ionization and pK'A's of Some Buffers of Biochemical Interest at High Ionic Strength. NM 000 018.06.40, 22 December 1955.
4. Surface Diffusion and Thermal Transpiration in Fine Tubes and Pores. NM 000 018.06.47, 12 January 1956.
5. Histologic Changes in the Incisor Teeth of Rats Serially Sacrificed after Receiving 1500 r of 200 KV X-Ray Irradiation. NM 006 012.04.99, 19 January 1956.
6. Pharmacological Studies on Irradiated Animals. Part V. The Effects of Postirradiation Administration of Vitamin K on X-Ray Induced Mortality. NM 006 012.05.16, 19 January 1956.
7. Further Studies with Cell-Free Extracts from Mouse Spleen on X-Ray Induced Mortality. NM 006 012.04.80, 25 January 1956.
8. Investigation and Improvement of Systems for Simulating Instrument Conditions in Aviation Instrument Flight Training. (Instrument Flight Simulation) NM 001 056.07.04, 27 January 1956.
9. A sensitive and Stable Direct Current Recorder Amplifier. Memo Report 56-2. NM 000 018.03, 7 February 1956.
10. Blood and Urinary 17-Hydroxycorticosteroids in Patients with Severe Burns. NM 007 081.22.07, 8 February 1956.
11. The Relationship Between Adrenal Weight and Population Status of Urban Norway Rats. NM 004 005.08.05, 23 February 1956.

12. Demonstration of Corrosion Casts in Relationship to Gross Morphology by Embedding in Clear Plastic Models. NM 007 081.14.02, 1 March 1956.
13. The Inhibition of Steroidogenesis by Amphenone "B" In Vitro Studies Using the Perfused Calf Adrenal. NM 006 012.04.94, 1 March 1956.
14. The Enzymatic Activity of Radiated Exteriorized Salivary Glands. NM 006 012.04.100, 11 March 1956.

Naval Medical Research Unit No. 3, Cairo, Egypt

1. Research Progress Summary Report. Period 1 January 1955 - 31 December 1955.

Naval Air Development Center, Johnsville, Pa.

1. NADC-MA-5601. Determination of Cerebral Blood Flow Using Radioactive Krypton. NM 001 100 301, 20 February 1956.
2. NADC-MA-5602. A Study of Adaptation of Acceleration with Rats and Guinea Pigs as Test Animals. NM 001 100 306, 27 February 1956.
3. NADC-MA-5603. A Method for the in Situ Study of Aortic Elasticity in the Dog. NM 001 100 315, 27 February 1956.

Naval Medical Research Laboratory, Submarine Base, New London, Conn.

1. An Evaluation of the Use of Baralyme in the Submarine Escape Appliance. NM 002 015.08.04, 9 February 1956.

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BUMED INSTRUCTION 6820.8

20 April 1956

From: Chief, Bureau of Medicine and Surgery
To: Non-BuMed Management Controlled Activities Having Medical/Dental Corps Personnel Assigned

Subj: Professional medical and dental periodicals; responsibility for notification of nonreceipt and changes of mailing address

Ref: (a) BuMedInst 6820.1B, Subj: Subscriptions to professional Periodicals
(b) OpNav P213-105, Catalog of Naval Shore Activities
(c) OpNav P213-107, Standard Navy Distribution List

This instruction advises activities for whom periodicals have been purchased by the Bureau, in accordance with paragraph 4 of reference (a), that responsibility for notifying contractors of nonreceipt of periodicals and changes of

mailing address shall be assumed by the addressee. Paragraph 4b of reference (a) is canceled.

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BUMED INSTRUCTION 6320.20

10 May 1956

From: Chief, Bureau of Medicine and Surgery
To: All Continental Stations Having Medical/Dental Personnel Regularly Assigned

Subj: Medical and dental care of Canadian military personnel and their dependents

Ref: (a) DOD Directive 6310.5, same subject (Notal)
(b) SecNavInst 6320.5, same subject (Notal)

This instruction is published for information and compliance with regard to medical and dental care provided Canadian military personnel serving in the United States, and their dependents, in Navy medical and dental treatment facilities, in accordance with references (a) and (b).

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BUMED INSTRUCTION 1520.9

11 May 1956

From: Chief, Bureau of Medicine and Surgery
To: All Naval Hospitals

Subj: Medical intern training program

Ref: (a) Essentials of an Approved Internship, Revised to December 4, 1952, prepared by the Council on Medical Education and Hospitals of the American Medical Association

This instruction sets forth pertinent data pertaining to medical intern training in naval hospitals to be effective after 1 July 1956. BuMed Instruction 1500.3A is canceled, 30 June 1956.

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BUMED NOTICE 5101

15 May 1956

From: Chief, Bureau of Medicine and Surgery
To: Activities Under Management Control of BuMed

Subj: "Slow Down and Live" Campaign

Encl: (1) SecNav Notice 5101 of 10 Apr 1956 w/enclosure

This notice transmits enclosure (1) for appropriate action.

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BUMED INSTRUCTION 6700.16

15 May 1956

From: Chief, Bureau of Medicine and Surgery

To: All Ships and Stations Having Medical/Dental Personnel Regularly Assigned

Subj: Bureau controlled medical and dental items

Ref: (a) BuMedInst 6700.14 (formerly 4442.1A), Subj: Levels of supply for medical and dental stores at consumer activities
(b) BuMedInst 6700.9 (formerly 4220.2A), Subj: Requisitioning and receipt of medical and dental material (Cognizance Symbol "L"); instructions concerning
(c) BuMedInst 6700.13 (formerly 4441.3), Subj: Authorized Initial Outfitting Lists of Medical and Dental Material for Naval Vessels (Notal)
(d) Art. 25-21 (13) ManMed

Encl: (1) Supplementary listing of Bureau controlled items applicable to activities under the management control of BuMed
(2) Supplementary listing of Bureau controlled items applicable to activities Not under the management control of BuMed

This instruction provides identification of Bureau controlled items and indicates the justification required on requisitions for such items.

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BUMED INSTRUCTION 6710.30

18 May 1956

From: Chief, Bureau of Medicine and Surgery

To: All Ships and Stations

Subj: Defective medical and dental material; authority for disposition of

Ref: (a) Medical and Dental Materiel Bulletin, Edition No. 66 of 1 May 1956
(b) Art 25-21 ManMed

This instruction provides authority for disposal of defective material.

DENTAL SECTION



Protecting Dental Personnel from X-Ray Radiation

The National Committee on Radiation Protection advises that 0.3 r (roentgen) per week is the maximum permissible dose, either single or cumulative, for persons working with or in the vicinity of an x-ray machine. A full mouth series of 14 periapical films will expose the operator to 0.01 r when standing 3 feet from the cone and out of the line of the useful beam. Under this condition, it is apparent that one operator can make approximately 30 full mouth series (average, 3 seconds per film), or about 400 periapical roentgenograms per week and remain within the maximum permissible dose. The table below indicates safe distances and workload limits when an x-ray protective screen is not used and the operator is out of the line of the useful beam. The distances given are from the cone to the operator utilizing 10 milliamperes.

<u>Distance (feet)</u>	<u>Exposure (seconds)</u>	<u>Exposure (MA seconds)</u>	<u>Films per Week (3 sec. average)</u>
2	600	6,000	200
3	1,200	12,000	400
4	1,600	16,000	525
5	2,000	20,000	650

Extreme care should be exercised by dental personnel to insure that maximum safety measures are employed at all times when working with or in the vicinity of the dental x-ray machine. These safety measures include:

1. Not holding the film packet in the patient's mouth during exposure.
2. Not holding or "steadyng" the cone with the hand during exposure.
3. Standing behind the tube head and as far removed from the cone and the line of the useful beam as possible during exposure.
4. Routine check for x-ray radiation through the wearing of film badges by personnel continuously exposed to secondary and/or stray radiation in the x-ray exposure room or adjacent spaces in compliance with NavMed P-1325 (Radiological Safety Regulations).

5. Rotation of personnel where the volume of x-rays approximates or exceeds the maximum permissible total weekly dose.

6. Use of an x-ray protective screen when required.

Dental activities with a photodosimetry requirement may requisition Holder, Radiac Detecting Element, Film Badge Type (FSN 6665-299-9825) and Film, Dental Radiographic, Radiac Detecting, 50s (FSN 6525-299-9824) from the Naval Supply Depot (Medical-Dental Stores Section), Mechanicsburg, Pa. Screen, X-Ray Protective (FSN 6525-612-8025) should be requisitioned when the workload is sufficient to justify its use. This item is 72 inches high, 36 inches wide, and has a 16-inch center arc depth.

National Bureau of Standards Handbook No. 60 of 1 December 1955 (superseding HB No. 41) may be used for reference in determining structural shielding requirements for the protection of personnel in adjacent spaces when it is determined they are subject to exposure to excess secondary and/or stray radiation.

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Dental Examination on Standard Form 88

The Bureau of Medicine and Surgery depends upon examining officers to evaluate and record their findings on the Standard Form 88. In reference to the dental examination, Article 6-58, Manual of the Medical Department, requires that "care shall be taken to indicate in each case whether or not the examinee meets the dental standards related to the purpose of the examination. Disqualifying defects shall be entered in detail." When there is no state statement that the examinee "does or does not meet the dental standards," or if other required information is missing, the final evaluation of the Standard Form 88 in the Bureau of Medicine and Surgery is delayed by the necessity of additional correspondence. This evaluation will be aided considerably if examining officers will enter in Block 44 whether or not the examinee meets dental standards.

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Color Atlas of Oral Pathology - 1956 Distribution of Additional Copies

In the near future, additional copies of the Color Atlas of Oral Pathology will be distributed to the larger naval dental activities including those conducting training programs.

The Atlas has been received with great enthusiasm by the dental profession and from Federal medical and dental services as evidenced by the warm praise contained in numerous letters received by the Bureau.

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Advanced Base Command Program

Naval Reserve Dental officers are included in the allowances for the officer structure for three units in the Naval Reserve Advanced Base Command Program as described in BuPers Instruction 4040.1C.

These units are described as Lion Command Division, Cub Command Division, and Acorn Command Division. A Lion Division includes personnel for assignment to a large advanced base, Cub Division to a small advanced base, and Acorn Division to a Naval Air Station in an advanced base.

The above units are also listed in the pay program. Members are required to conduct 48 drills and perform 2 weeks active duty for training each year.

Information may be procured from District Commandants as to the availability of billets in these divisions.

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Additional Member of the American Society
of Oral Surgeons

The Dental Corps News of 28 March 1956 contained a list of naval dental officers who are members of the American Society of Oral Surgeons.

The name of Captain Joseph F. Link, DC USN, presently on duty at the Naval Dental Clinic, Norfolk, Va., was erroneously omitted from this list.

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Oral Surgery

Out of 538,181 oral surgery procedures done in the Navy during 1955, a total of 27,160 procedures or 5.1% were done in naval hospitals. Of all oral surgery procedures, 44.8% were accomplished at recruit training centers. As might be expected, the oral surgery procedures done at naval hospitals are more complicated and time-consuming. For instance, in 1955, naval hospitals did 56% of all biopsies, 86.3% of fractured mandible reductions, 84.3% of fractured maxilla reductions, 75% of other fractured facial bone reductions, and 35.4% of tumor excisions. The great preponderance of all other categories of oral surgery procedures was done at dental activities other than naval hospitals.

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The printing of this publication has been approved by the Director of the Bureau of the Budget, 16 May 1955.

Recently Appointed Diplomates of American
Board of Oral Surgery

Captain Gerald H. Bonnette, DC USN, U.S. Naval Hospital, Pensacola, Fla., Captain Donald E. Cooksey, DC USN, U.S. Naval Dental School, National Naval Medical Center, Bethesda, Md., and Commander Edward A. Gargiulo, DC USN, U.S. Naval Hospital, Beaufort, S.C., have recently notified the Dental Division, Bureau of Medicine and Surgery, of their certification by the American Board of Oral Surgery.

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Alternates for Dental Internship

Ensign Donald C. Weikert, University of Maryland, and Ensign Jack G. Braswell, University of Louisville, have been selected into the Navy Dental Intern Program, replacing two ensigns originally selected for that program.

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The Ensign 1995 Dental Orientation Program

The Orientation Program was first established in fiscal year 1956 to provide Ensigns 1995 (Dental) with training in naval dental and military procedures. Through such training, the student ensign upon graduating from dental school may go directly into his professional duties without loss of time occasioned by the necessity of indoctrination.

Last year this course proved to be very popular. A quota of one hundred ensigns for 60 days' training was established during the year. In order to meet varying conditions at the dental colleges of the United States, training opportunities for more ensigns were made available by dividing these 60-day training periods into shorter periods. Thus, a quota of one ensign for 60 days' training could be divided into two periods for two ensigns for 30 days' training, or four periods of training for four ensigns for 15 days. Practically all of this quota was used during fiscal year 1956.

There has been increasing interest in this training program as shown by the increased number of applications for training for the ensuing year. Most Districts have asked for increase in their quota. After a study was made of these additional requests, the Bureau of Naval Personnel, at the request of the Dental Division, granted an increase of quotas to approximately 133, the increases being allotted mainly to those Districts in which there was a greater demand.

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BuMed Instructions and Notices

BuMed Instruction 6820.8 of April 20, 1956—Professional, medical, and dental periodicals; responsibility for notification of nonreceipt and change of mailing address.

Purpose: To advise dental activities for whom periodicals have been purchased by the Bureau that it is their responsibility to notify contractors of nonreceipt of periodicals and changes of mailing address.

BuMed Notice 6750 of April 17 1956—NavMed 1301 Statement and Inventory of Precious and Special Dental Metals; preparation and submission of.

Purpose: To restrict the requirement for the preparation and submission of NavMed-1301 to those dental activities authorized to provide dental prosthetic care.

BuMed Notice 1500 of April 17 1956—This notice contains a Bureau policy statement that newly appointed dental officers may not request authorization orders or temporary additional duty for the purpose of taking state board licensure examinations. Further, this notice suggests that dental officers desiring to take state board examinations should request annual leave for this purpose.

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MEDICAL RESERVE SECTION

Correspondence Courses Available

Two excellent correspondence courses entitled, Manual of the Medical Department, Part I, NavPers 10708 and Manual of the Medical Department, Part II, NavPers 10709, are available to eligible Regular and Reserve officer and enlisted personnel of the Medical Department.

Manual of the Medical Department, Part I

This course is designed to allow Medical Department personnel to familiarize themselves with the functions of administration, organization, and management of facilities under the cognizance of the Bureau of Medicine and Surgery.

In matters of administration, the Medical Department is guided by Navy Regulations, current Bureau of Medicine and Surgery directives, and the

Manual of the Medical Department, therefore, certain chapters of the Manual of the Medical Department have been included as the principal text for the course. The material embraces authoritative methods and procedures and discussions of approved essential organizational structure of the Medical Department components from the Bureau of Medicine and Surgery, the various field agencies in all areas of activities, through the regional and Naval District medical staff to the Medical Department organization in ships and on shore stations.

Completion of this course will enable the enrollee to acquire essential knowledge of the significant functions of the Medical Department in its relation to the Naval Establishment ashore and afloat in all of its far-flung activities and increase his or her over-all efficiency.

Consisting of ten objective question type assignments, the course is evaluated at 24 Naval Reserve promotion and non-disability retirement points. Completion letters are prepared upon satisfactory completion of assignments as follows: 1 through 5 - 15 points; 6 through 10 - 12 points.

Manual of the Medical Department, Part II

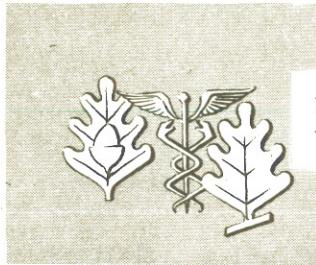
This course is designed to acquaint and familiarize Medical Department personnel with the procedures that must be followed in performing professional and administrative functions.

The course is based on Army Regulations 40-115 which is the regulation establishing physical and mental standards for induction and enlistment to be used by the Armed Services, and on chapters 15, 23, 24, 25, and Appendix A of the Manual of the Medical Department, 1952 edition; physical standards, methods of procedure in conducting physical examinations, and physical profiling required for original appointment and promotion to commissioned rank, appointment to the Naval Academy, enlistments and inductions in the Navy and Marine Corps. Included in this material is the necessary criteria concerning the use of forms and reports for the purpose of recording the physical examination findings. Pertinent information relating to reports, forms, and records requirements, and fiscal and property management procedures is covered by chapters 23, 24, and 25 of the Manual of the Medical Department. Sample copies of certain selected DD, NavCompt, NavExos, PHS, NavMed, and Standard Forms are included for information and guidance. Appendix A, Treaties and Conventions, delineates the responsibilities of the personnel of the Medical Department in relation to international treaties and conventions adopted by the United States Government, including the handling of sick or wounded personnel and war prisoners on land and sea.

Consisting of eight objective question type assignments, the course is evaluated at 18 Naval Reserve promotion and non-disability retirement points. Completion letters are prepared upon satisfactory completion of assignments as follows: 1 through 5 - 12 points; 6 through 8 - 6 points.

Applications for the foregoing courses should be submitted on form NavPers 992 (Rev 10-54) and forwarded via appropriate official channels to the Commanding Officer, U. S. Naval Medical School, Correspondence Training Division, National Naval Medical Center, Bethesda 14, Md.

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PREVENTIVE MEDICINE SECTION

Third Industrial Noise Conference

The Third Industrial Noise Conference was held November 15, 1955 in Buffalo, N. Y., The conference was sponsored by the Associated Industries of New York, Inc. The papers presented were classified into five groups dealing with various aspects of industrial noise:

1. Principles of hearing measurement
2. Principles of ear protection
3. Practical problems in industrial ear protection
4. Principles of noise control
5. Practical applications of noise control

The various disciplines necessary to conduct a successful hearing conservation program were mentioned, i. e., the physician, the industrial hygienist, the nurse, the acoustical engineer, the audiologist, the plant engineer, and the worker.

It was the consensus that the best ear protectors are usually composed of pliable or semipliable plastic and insert into the ear canal. Most of the acceptable protectors on the market provide 10 to 15 decibels attenuation below 1000 cycles per second and 15-40 decibels above 1000 cycles per second in regular field use. With adequate knowledge of the noise exposure, it should be possible to estimate the degree of protection to be expected. This is especially applicable in those industries in which the control of noise by engineering methods is impractical.

Whatever the approach to an ear protection program, it seems certain that considerable thought must be given to program organization. Equally important is the exercise of close employee supervision to insure desired results.

The control of any hazard at the source or by engineering means is usually preferable to the provision of personal protection. In approaching the problem of noise control, an understanding of the basic principles involved is essential. These principles are:

1. Substitution of less noisy operations
2. Eliminating noise at its source
3. Isolation of the noise source or of the worker
4. Increasing distance between the noise source and the exposed workers
5. Providing sound absorption
6. Personal protective equipment

There are no set procedures in establishing a hearing conservation program in industry. However, the potential importance of this problem suggests the need for a positive program wherever potential noise hazards exist. A possible approach might be as follows:

1. Make one person responsible for the program on either a full-time or a part-time basis.
2. Outline a hearing conservation program
3. Evaluate noise exposures
4. Establish noise control areas
5. Establish a noise control committee
6. Establish an audiometric testing program

(Walworth, Herbert T., Summary of Report on the Third Industrial Noise Conference: Am. Indust. Hyg. Assn. Quarterly J., 17: 58, March 1956)

Note: Naval industrial activities should find the principles emphasized in the foregoing abstract helpful in resolving noise problems.

* * * * *

Postgraduate Training in Preventive Medicine
Leading to a Degree

There is a critical need for medical officers trained in the basic disciplines of public health: epidemiology, biostatistics, microbiology, sanitary engineering, and public health administration.

Medical officers of the Regular Navy and Reserve officers who contemplate transfer to the Regular Navy or who have completed their obligated service and request extension of active duty for two years after completion of training, and who desire to specialize in preventive medicine, are invited to make immediate application for one academic year of postgraduate training beginning in August, September, or early October 1956. The choice of school can be made for this training which may be taken at any one of the accredited schools of public health in the United States offering a course leading to the

degree of Master of Public Health or an equivalent certificate. Applications should be forwarded as soon as possible to the Chief of the Bureau of Medicine and Surgery, via the commanding officer, with a reference to this article, and should be accompanied by an appropriate obligated service agreement in accordance with BuMed Instruction 1520.7 of 4 August 1954.

Several schools of public health also afford opportunity for specialized study in industrial health leading to the degree of Master of Industrial Health.

Among the interesting assignments available to young medical officers who successfully complete the course are: preventive medicine units ashore both in the continental United States and in overseas areas; medical research units; preventive medicine duties at naval training stations; the Bureau of Medicine and Surgery; and various naval schools as instructors in such subjects as epidemiology, environmental health, preventive medicine, and related laboratory sciences. For those who major in industrial health, there are opportunities for assignment as industrial medical officers in the various naval industrial activities. The basic courses are also of value to any medical officer interested in clinical research, aviation medicine, submarine medicine, preventive psychiatry, or various other facets of Navy medicine.

The broad knowledge and experience to be gained in a successful career in preventive medicine, whether it be in public health or in occupational health in the Navy, provide outstanding preparation for the responsibilities to be assumed with advancement in rank through the senior grades. Such knowledge and experience also provide the background necessary for appointment to many occupational health positions, public health positions, and teaching posts in civilian medicine when the Navy career is completed. Successful completion of this training meets part of the academic requirement for the American Board of Preventive Medicine and for certification by examination in public health, aviation medicine, or occupational medicine.

At least four or five more applicants are urgently needed this year to fill existing vacancies in the preventive medicine service of the Navy. Candidates desiring more information on postgraduate training in preventive medicine are invited to direct their questions to the Bureau of Medicine and Surgery.

* * * * *

Serologic Tests for Syphilis

In a recent issue of the U.S. Navy Medical News Letter, (Vol. 27, No. 8, pp. 35-36, 23 March 1956), an article on the Treponema pallidum Immobilization Test for Syphilis (TPI) appeared indicating the value of this test in the differential diagnosis between syphilis and a biologic false-positive result in standard serological tests. In the February 1956 issue of the American Journal of Public Health (Vol. 46, No. 2, pp. 190-194), Harold J. Magnuson, M.D., and Joseph Portnoy, Ph.D., report briefly on the Treponema

pallidum Complement-Fixation Test (TPCF). From the data presented, this test appears to be somewhat more reactive in primary and secondary syphilis, whereas the TPI test gave a higher percentage of positives in central nervous system syphilis. The TPCF and TPI tests had better than 90% correlation in biologic false-positives.

The authors point out the great value of the TPI test and the limitations of this test in general usage because of the technical difficulties associated with its use. Commercial preparation of the TPCF test antigen is being undertaken by two firms. If further evaluation of this test confirms its apparent value for the recognition of syphilis, it is anticipated that any well-run serologic laboratory will be able to perform it.

A comprehensive comparison of a number of serologic tests, including the TPCF and TPI tests, is being undertaken in an effort to further define the relative value of the different tests in the hands of different laboratories. It is anticipated that the laboratory at the Naval Medical School, National Naval Medical Center, Bethesda 14, Md., will be one of the participating laboratories in these studies. Within a year or so, these studies should provide much better information on the TPCF and TPI tests and point the way for more standardized methods to be followed in the serologic diagnosis of syphilis.

* * * * *

Resistance of Insects to Insecticides

The dramatic reduction in the incidence of arthropodborne diseases, which has been brought about by the widespread use of DDT and other chlorinated hydrocarbon insecticides, is well known. For several years it was thought that at last man had weapons with which the vectors of malaria and other formerly disastrous diseases could be eradicated.

These idealistic expectations were short-lived, however, and the development of resistance to this group of insecticides by medically important insects has become widespread. An appreciation of the scope of this problem can be derived from the fact that insecticide resistance has now been demonstrated in bedbugs, cone-nose bugs, body lice, cockroaches, fleas, sandflies (Phlebotomus), houseflies, and at least 17 species of mosquitoes.

While the detection of insecticide resistance is important in all insect-control operations, it is imperative that entomologists working with military forces in the field anticipate the development of resistant strains of medically-important insects and be prepared to detect insect resistance in its incipience. Such preparedness is urgent in order to prevent the occurrence of casualties and to forestall any unnecessary burden on the supply system of the military forces involved. As with other supplies, insecticides for military campaigns must be procured well in advance of the operation, and, if the insecticides prove noneffective, serious epidemics may result before satisfactory replacement materials can be developed and delivered to the theater of operations.

The knowledge that many insects are resistant to insecticides is so well disseminated that many times, unfortunately, resistance is used as an excuse for not doing proper control work. Initially, reports of resistance should be viewed with some skepticism; other possible reasons for lack of adequate control such as improper application of materials, improper mixing, faulty labeling of containers, decomposition of insecticide, et cetera, should first be ruled out before the conclusion is reached that resistance has been encountered. The opinions of experienced operators should be respected, however, since they are the first to notice when standard insecticides begin to show less than the usual degree of control and to find that more frequent and heavier applications are necessary.

Because of the problems outlined above, it has appeared desirable to prepare instructions for comparatively simple standard tests that can be used to determine whether the common arthropods of military importance have developed resistance to the insecticides used by the Armed Forces. It is believed that such tests are completely necessary if the utmost in economy and safety of the military pest-control program is to be accomplished.

Accordingly, a proposed manual of standard tests has been jointly prepared by the entomological personnel of the Army Environmental Health Laboratory and the Naval Medical School. Copies of the manual manuscript have been submitted to the Preventive Medicine Units and to other agencies employing specialists in the field of insect control with the request that appropriate comments and/or suggestions and significant test results be submitted to the Bureau of Medicine and Surgery. The Surgeons General of the Army and the Air Force are following a similar plan. The manual's publication and distribution early in 1957 are in prospect.

To expedite the determination of a suitable set of standard test methods and to insure that all information of possible value to the study of insecticide resistance is made available, field activities are invited to take pertinent problems to their appropriate District or Senior Command level technical personnel.

* * * * *

Surface Film on Swimming Pools

(The following is an abstract of an article in the March 1956 issue of the Canadian Journal of Public Health, implications of which are far-reaching and appear to open the door to new facets of swimming-pool sanitation not seriously considered in the past.)

Those who have studied the problem of swimming-pool sanitation are well aware of the many ways in which the water may become polluted. There are certain types of pollution which are not controlled by routine

methods. Samples of water, taken in the conventional manner one foot or more below the surface, may be accepted as representative of the main body of the water, but they fail to disclose the conditions existing at the air-water interface. It is on the surface of the water that mucus and associated bacteria from the respiratory tract collect, and it is here also that sebaceous secretions, sun-tan oils, and water-insoluble constituents of other cosmetic preparations tend to accumulate. The surface film thus produced must inevitably enter the mouth and nasal passages of the bather; in this manner, infective agents may be transmitted from one person to another even though there is an effective concentration of chlorine in the water below.

This concept of pollution from surface films is now being studied experimentally in the laboratory of the author in order to assess its importance as a practical problem. The first step was to find some means of collecting samples of surface film in a quantitative manner. This was accomplished by making use of the properties of calcium alginate. A description of the results so far obtained are presented

The results suggest that before a swimming-pool can be pronounced as satisfactory, the surface water as well as the main body of the water should be examined bacteriologically. Six samples of surface water taken at different sites should be collected when the pool is in use, preferably during the period of heaviest load for the day. At present, collection of surface film on alginate gauze is the only method capable of giving quantitative results.

Most swimming-pools as now constructed and operated depend upon overflow gutters for the removal of surface pollution. The importance of these gutters is emphasized by the present studies. According to the recommendations of the American Public Health Association on which most official regulations in North America are based, drainage from overflow gutters may be discharged to sewers or to suction of recirculation pumps. The former method is here advocated because it continuously removes that portion of the water which carries most of the bacteria likely to cause human disease. Gutters should extend around the entire pool, not at the deep end only as is often the case.

Surface film could be swept into the gutters at regular intervals by mechanical means. This could be done, for example, by a light but rigid plastic tube, closed at both ends, and a few inches shorter than the width of the pool. This tube, floating on the surface of the water, would be slowly towed from one end of the pool to the other by 2 attendants, one on each side. This procedure could be repeated once an hour, the pool being cleared of swimmers for a few minutes to allow this to be carried out.

It is difficult to obtain reliable information about the amount of illness attributable to swimming pools. The general opinion is that there is more

upper respiratory infection in swimmers than in nonswimmers; but against this must be set the health-promoting effect of a well managed pool.

The presence of viruses in swimming-pool water has not yet been demonstrated directly, though inclusion conjunctivitis (if this disease is accepted as a viral infection) is certainly transmitted in this manner. Evidence is rapidly accumulating that swimming pools play an important role in the spread of pharyngeal conjunctival fever. The alginate method of collecting surface film may prove of value to virologists planning further research on this subject. (Amies, C.R., M.S., MRCP, (Lond.), Department of Bacteriology and Provincial Laboratory of Public Health, University of Alberta, Edmonton, Canada; Surface Film on Swimming Pools: Canad. J. Pub. Health, 47: 93-102, March 1956)

* * * * *

Descaling Dishwashing Machines

The accumulation of scale deposits in dishwashing machines is of public health significance for at least two reasons: Excessive scale deposit on the inside of piping and pumps clogs them and interferes with the efficient performance of the machines by reducing the volume of water that comes in contact with the utensil in the washing and sanitizing process. Furthermore, scale deposits may provide a haven for dangerous bacteria.

The following method of descaling dishwashing machines has been found to be effective yet safe enough to be used by personnel trained in maintenance procedures:

1. Half fill the tanks to overflow level with hot clean water.
2. Add the required amounts of acid and wetting agent to prepare the cleaning solution (7 fluid ounces Orthophosphoric Acid 85% plus 1/2 fluid ounces wetting agent for each gallon capacity of the tank when filled to overflow level).
3. Complete filling tanks to overflow level.
4. With scrap trays, spray arms, and curtains in place, operate the machine at the highest possible temperature for 30 minutes.
5. Remove the cleaning solution completely by draining the tank and rinsing it thoroughly by refilling with fresh hot water and then operating the machine—again at the highest possible temperature—for 5 minutes. The rinsing procedure should be repeated several times.

The supplies required for descaling are available through Navy supply channels as follows:

1. Orthophosphoric Acid 85%, Technical, 7-lb. bottle, Stock No. G6810-264-6722.

2. Wetting Agent, 1-qt bottle, Stock No. G6850-282-9702
- Wetting Agent, 1-gallon can, Stock No. G6850-282-9699.
- Wetting Agent, 5-gallon drum, Stock No. G6850-282-9701.

When the capacity of dishwashing machine tanks is unknown, inside dimensions (in inches) of each tank may be applied to the following formula to calculate capacity in gallons:

$$\frac{\text{Length} \times \text{width} \times \text{depth (to water line)}}{231} = \text{capacity in gallons}$$

The method described should be repeated at such intervals as may be required to assure freedom from interference with efficient operation of the dishwashing machine.

* * * * *

Outbreak of Infectious Hepatitis

The following discussion of an outbreak of infectious hepatitis at a Marine Air Base in Korea was contained in the monthly report from Preventive Medicine Unit No. 8 for February 1956. The full report contained a detailed epidemiologic study of the epidemic and effects of gamma globulin. The summary is published as an example of the service which preventive medicine units can perform for operational units in the field and as an illustration of the educational value of the results of such investigations when carried out by competent investigators.

An outbreak of 25 cases of infectious hepatitis with jaundice occurred at a Marine Air Base in Korea during the 93-day period from 15 July to 16 October 1955. Two additional cases of hepatitis were suspected—both anicteric—during this period. No cases had occurred at this base during the 4 months prior to this outbreak and no cases occurred for at least 3 months following 16 October. Epidemiological data suggested that all but one of the first 17 cases were probably infected at about the same time, perhaps from a common source, but it could not be ascertained whether the source was food or contact with a subclinical or convalescent carrier. The later group of patients in the outbreak were more scattered in both location and time and probably were not infected by a common source.

Investigation of the outbreak at the beginning of September revealed that most of the patients known at that time, including three food handlers, had been on duty for several days after the onset of symptoms. The personnel of this base represented a militarily critical group located in an endemic area of hepatitis where wholly satisfactory control of the environment, control of potential carriers, and proper isolation of cases were considered unlikely. Because of these facts, personnel of components with the largest incidence of cases were inoculated with gamma globulin on 7 and 8 September. Individuals weighing 180 pounds or less received 1.5 cc. and those weighing more

than 180 pounds received 2.0 cc. Personnel coming into these particular components during September and October were also inoculated.

Six cases occurred after the initial mass inoculation, four among 1627 uninoculated personnel who were on station at the time of the initial inoculation or who came aboard during the ensuing 4-month study period, and two among the 1710 inoculated base personnel. Of the two cases in inoculated personnel, one occurred 4 days after inoculation, the other 12 days after inoculation. The latter was one of the suspected, but unproven, anicteric cases. The number of cases occurring after the initial mass inoculation was too small to evaluate the efficacy of the mass procedure by comparison with the uninoculated group, but, considering the previous incidence rate among the inoculated components, one might have expected a larger number of cases had the gamma globulin not been used. The fact that no cases of infectious hepatitis have occurred at this base among either the inoculated or the uninoculated personnel for the 3 months immediately past in spite of the constant arrival of newcomers to the base and the discontinuance of gamma globulin inoculations at the end of October, was somewhat unexpected and is unexplained.

It is known that immune gamma globulin in certain dosage gives passive protection against infectious hepatitis as late as 6 days before onset of the disease and lasting 6 to 8 weeks. It is not clear whether or not modification of the disease occurs before 6 days or for any period after 6 or 8 weeks. Neither is it known whether inoculation with immune gamma globulin allows hepatitis virus multiplication in the inoculated individuals. It has been suggested by workers in this field that individuals inoculated with immune gamma globulin and subsequently heavily exposed to hepatitis virus over several months' time may develop a more permanent type of immunity. One possible explanation of this is that active immunization may be superimposed on passive protection under certain circumstances. These mechanisms might account for the lack of cases in the inoculated individuals for a period considerably beyond 6 or 8 weeks after inoculation. If one postulates that immune gamma globulin does allow virus infection and multiplication in the inoculated individual, but prevents clinical manifestations, then one would think that the disease rate among the uninoculated might actually increase after the time of initial mass inoculation because some individuals excreting virus, who would be removed from circulation by hospitalization if they had manifest disease, are in fact not removed because their infection is not recognizable. Admittedly, this manner of increasing the number of sources of infection might be a small factor if one considers the large number of natural epidemic and endemic subclinical cases available for spread of the disease.

It would appear that one or all of the following factors may have been active to account for the sparsity of cases in the uninoculated group after the time of the initial mass inoculation and the complete absence of cases in this group for at least 3 months beginning 5 weeks after the mass inoculation:

The individuals making up the uninoculated group were sufficiently separated from the higher disease incidence components and there was never a large number of infected individuals available to transmit the disease in these uninoculated components; An increased practice of good sanitary precautions on the part of all base personnel acted materially to diminish transmission of the hepatitis virus; The number of immune individuals (including the passive immunes) was sufficient to materially curtail the spread on the base—a factor which would presume the concept that the immune individuals do not become virus excretors when infected. It would appear unlikely that no susceptibles remained among the uninoculated group or that no sources for hepatitis virus existed at the base.

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